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## RADIOLITES, Lam.

Subgenus TAMIOSOMA, Conrad.

R. GREGARIA, Conrad. Explorations and Surveys for Rail-road route to Pacific, vi. 72, iv. 18. This fossil is characteristic of the Cretaceous formation in California.

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October 4th.

MR. LEA in the Chair.

Eighteen members present.

The following papers were presented for publication :

"On a blind Silurid from Pennsylvania," and "On the Characters of the higher groups of Reptilia squamata, &c." By E. D. Cope.

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October 11th.

DR. BRIDGES, Vice-President, in the Chair.

Fifteen members present.

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October 18th.

DR. McEUEEN in the Chair.

Nineteen members present.

The following paper was presented for publication : "Fasti Ornithologiæ." No. 1. By John Cassin.

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October 25th.

DR. BRIDGES, Vice-President, in the Chair.

Fourteen members present.

On report of the respective committees, the following papers were ordered to be published :

**Synopsis of the PLEURONECTOIDS of the Eastern Coast of North America.**

BY THEODORE GILL.

In the present brief article, an analytical synopsis distinguishing the genera of east coast *Pleuronectoids*, already named, is submitted, and the different names under which the species have been described are referred to the synonymy of the species to which they are supposed to belong ; and, in one case, (*Reinhardtius hippoglossoides*) where the decision of the synonymy would involve the nomenclature and geographical distribution of two widely distinct forms, the synonymy has been quite fully discussed. If the premises taken are correct, the genera herewith enumerated are the only known forms as yet entitled to a place in the Fauna of the East Coast. If, on the other hand, that view against which I have contended is the true one, the genus *Glyptocephalus*, an ally of *Pleuronectes*, must be added, and the name *Reinhardtius hippoglossoides* replaced by another.

[Oct.

Family *SOLEOIDÆ*, Bon.Subfamily *SOLEINÆ*, (Bon.)*ACHIRUS*, Lac.

*Grammichthys* Kaup.  
*Trinectus* Raf.

*ACHIRUS LINEATUS*, Cuv.

*Pleuronectus achirus* L.  
*Pleuronectus lineatus* L.  
*Achirus fasciatus* Lac.  
*Pleuronectes mollis* Mit.  
*Achirus* (lineatus) Cuv.  
*Achirus mollis* St.  
*Grammichthys lineatus* Kaup.  
*Solea achirus* Gthr.

Subfamily *PLAGUSINÆ*.*PLAGUSIA*, Brown.

*Aphoristia* Kaup.  
*Glossichthys* Gill.

*PLAGUSIA PLAGIUSA*, Gill.

*Pleuronectes plagiusa* Linn.  
*Plagusia fasciata* Dek.  
*Glossichthys plagiusa* Gill.  
*Hab.*—North and South Carolina.

Family *PLEURONECTOIDÆ*, Bon.

We owe to Cuvier the first natural subdivision of the genus *Pleuronectes*, as restricted by Quensel. That great philosopher distributed the representatives of the genus thus limited, which is equivalent to a family in the modern acceptance of the word, among three subgenera:—*Platessa*, in which the teeth of the jaws are uniserial, trenchant and obtuse, and those of the pharyngeal bones blunt; *Hippoglossus*, in which all the teeth are strong and acute, and *Rhombus*, similar to the latter, but with the dorsal advanced towards the edge of the upper jaw. The species respectively referred to these several groups are evidently closely related, and all possess characters coincident with those assigned by Cuvier, and apparently of greater value.

The *Platessæ* have a small oblique mouth in front of the eyes; the *Hippoglossi*, a large one extending below the eye; and in the *Rhombi*, the ventral fins are very broad at their bases, the rays distant, and the fin of the colored side on the ridge of the abdomen. These groups correspond to the subfamilies *Pleuronectinæ*, *Hippoglossinæ* and *Rhombinæ* as now limited, and thus have different elements from the subfamilies of Bonaparte. The natural character of these groups was first destroyed by the reference to the *Platessæ* of the *Pleuronectes limandoides* of Bloch. This fish was referred by Cuvier to the genus *Hippoglossus*, but was subsequently transferred by all naturalists to the genus *Platessa*, with which it neither agrees in technical characters nor in natural ones. Subsequent modifications of the subgenera of Cuvier rendered them still less natural, and the American species, especially, were grouped little in accordance with their affinities. In the following synopsis of the *Pleuronectoids* of Eastern North America, I have distributed the species in accordance with the Cuvierian ideas.

1. Mouth small, the supramaxillary ending before or under front of eye..... *PLEURONECTINÆ*.  
 A. Body with scattered ciliated scales. Teeth moveable..... *Euchalarodus*.

1864.]

- AA. Body with well developed scales. Teeth fixed.  
 a. Lateral line with no arch in front. Scales regularly imbricated..... *Pseudopleuronectes*.  
 aa. Lateral line with a semicircular arch in front.  
    $\beta$ . Snout conic; mouth moderately oblique.... *Myzopsetta*.  
    $\beta\beta$ . Snout retuse; mouth very oblique..... *Limanda*.  
 AAA. Body perfectly smooth..... *Liopsetta*.  
 II. Mouth large, the supramaxillars extending more or less under eye. Ventrals lateral..... HIPPOGLOSSINÆ.  
 A. Caudal entire and produced behind.  
    $\beta$ . Eyes on the right side.  
     Scales ctenoid..... *Hippoglossoides*.  
     Scales mostly cycloid..... *Pomatopsetta*.  
    $\beta\beta$ . Eyes sinistral; interorbital area flat..... *Chenopsetta*.  
 AA. Caudal emarginated, produced laterally.  
   Lateral line straight; dorsal and anal regularly arched..... *Reinhardtius*.  
   Lateral line arched in front; dorsal and anal rays elevated at middle of fins..... *Hippoglossus*.  
 III. Mouth large. Ventral fin of the dark side inserted on the ridge of the abdomen..... RHOMBINÆ.  
   a. Ventral fins very broad; dorsal fin with its anterior rays branched..... *Lophopsetta*.  
    $\beta$ . Ventral fins narrow; dorsal fin with all rays simple..... *Citharichthys*.

Subfamily PLEURONECTINÆ, Bon.

#### PSEUDOPLEURONECTES, Blkr.

PSEUDOPLEURONECTES AMERICANUS Gill.

*Pleuronectes americanus* Walb. Art. Gen. 113. Schn. 150.

*Pleuronectes planus* Mitch.

Flounder, Schn. 163.

*Platessa plana* Storer.

*Platessa pusilla* Dek.

*Pseudopleuronectes planus* Blkr.

*Hab.*—Eastern Coast.

EUCHALARODUS, Gill, n. g.

EUCHALARODUS PUTNAMI, Gill.

D. 55—58. A. 39—40. C. 3. 6. 6. 3. P. 10—11.

Alt. : Long. = 1; 2 4-5ths—2 $\frac{2}{3}$ .—Cap. 1: 4 $\frac{1}{2}$ —4 $\frac{1}{4}$ .

*Hab.*—Salem, Mass.

In a small collection of desired fishes, which I owe to the kindness of my friend, Mr. F. W. Putnam, of Salem, Mass., were two specimens of this undescribed representative of the Pleuronectinæ. The new species is generically distinct from any representative of the family hitherto found, not only of the eastern American seas, but from any yet known, although it shares some characters with a Russian fish, the *Platessa dwinitensis* of Liljeborg,\* (*Pleuronectes dwinitensis* Gthr.

\* Bidrag till Norra Rysslands och Norrriges fauna, &c., af Wilh. Liljeborg in Kongl. Vetenskaps-Akademiens Handlingar, för år 1850, (Stockholm, 1851.) p. 306, (256.) pl. xx., figs. 1-2.

"Maxilla utraque serie simpliciter dentium, forma isdem *Pl. vulgaris* auct. similium, contiguorum apicemae equaliter truncatorum.—Spina analis adest.—subtus albida, brevis." The italicized portion is repeated from Liljeborg's diagnosis. The relations of *Pl. dwinitensis*, consequently, appear to be with the true *Pleuronectes*.

## MYZOPSETTA, Gill.

## MYZOPSETTA FERRUGINEA, Gill.

*Platessa ferruginea* St. Rep. 41, pl. 2.

*Pleuronectes ferrugineus* Gthr., Cat. iv., 447.

*Hab.*—Massachusetts to New York.

## LIMANDA, Gottsche.

## LIMANDA ROSTRATA, Gill.

*Platessa rostrata* H. R. St., Boston Journ. N. H. v., 268.

*Myzopsetta rostrata* Gill, Cat. 51.

This species, referred with doubt to *Myzopsetta* in the "Catalogue of the Fishes of the Eastern Coast," belongs probably to *Limanda*.

*Hab.*—Labrador.

## LIOPSETTA, Gill.

This genus is proposed for the reception of the *Platessa glabra* of Storer, well distinguished by its form and details of structure, as well as its "perfectly smooth body," an almost anomalous character in the group of genera to which it belongs.

## LIOPSETTA GLABRA, Gill.

*Platessa glabra* St., Boston Proc. i., 130; *ib.* Mem. Am. Ac. viii., 393, pl. 31, f. 1.

*Hab.*—Massachusetts.

## Subfamily HIPPOGLOSSINÆ Gill.

## HIPPOGLOSSOIDES, Gottsche.

*Citharus Reinhardt*.

*Drepanopsetta* Gill.

Misled by the ambiguity of the description by Fabricius of the lateral line of *Pleuronectes platessoides*,—"Linea lateralis humilior, recta medietatem oculorum spectat, ventriculū tamen arcu ambiens angulo aperturæ branchialis summo terminata,"—I proposed for it the generic designation *Drepanopsetta*. That species, however, possessing, like *Hippoglossoides limandoides*, a straight lateral line, and otherwise agreeing so far as known, *Drepanopsetta* must be considered as a mere synonyme of the latter.

## HIPPOGLOSSOIDES PLATESSOIDES Gill.

*Pleuronectes platessoides* Fabr., F. G. 164.

*Platessa platessoides* St., Syn.

*Citharus platessoides* Reinh., Kr.

*Drepanopsetta platessoides* Gill, Cat.

*Hab.*—Greenland and Newfoundland, (Gill.)

## POMATOPSETTA Gill.

## POMATOPSETTA DENTATA Gill

*Platessa dentata* Storer, Rep.

*Hippoglossoides dentatus* Gill, Günther.

This species has been erroneously identified with the *Pleuronectes dentatus* of Mitchill, who described under that name a species of *Chænopsetta*, distinct from the one so named by Linnæus. I propose, however, to retain as its name *Pomatopsetta dentata*, since the *Pleuronectes dentatus* of Mitchill belongs to a widely different genus.

This is stated by Dekay to be "the summer flounder," and to be "extremely 1864.]

common in the markets of New York.' I doubt whether it inhabits the waters near the city. The specimens brought to the New York market are caught "down east," according to the fishermen. Dekay's description is evidently copied from Storer; erroneous proportions assigned by the latter being reproduced, and no figure is given.

#### CHÆNOPSETTA Gill.

##### CHÆNOPSETTA OCELLARIS Gill.

*Pleuronectes dentatus* Mitch., Trans. t. 390, (not L.)

*Rhombus aquosus* St. (not *Pl. aquosus* Mitch.)

*Platessa oblonga* Dekay.

*Platessa ocellaris* Dekay.

*Chænopsetta oblonga* Gill.

*Pseudorhombus oblongus* Gthr., iv. 426.

" *ocellaris* Gthr., iv. 430.

*Monst. Pleuronectes melanogaster* Mitch.

*Hab.*—Maine to North Carolina.

The verification on six individuals of the number of rays furnished the following results:

1. Beesley's Point, N. J.	D. 88.	A. 66.
2. New York.	89.	66.
3. Norfolk, Va.	91.	66.
4. Beesley's Point.	91.	67.
5. Old Point, Va.	92.	70.
6. Beesley's Point	94.	70.

The correctness of Günther's very wide separation of the *Platessa oblonga* and *P. ocellaris* of Dekay, after their union by his successors and countrymen, is, therefore, not evident.

##### CHÆNOPSETTA DENTATA Gill.

*Pleuronectes dentatus* L., i. 458.

*Pseudorhombus dentatus* Gthr., iv. 425.

*Hab.*—Charleston, S. C., Gordon, Girard.

##### CHÆNOPSETTA OBLONGA Gill.

*Pleuronectes oblonga* Mitch., Trans. i. 391.

*Platessa quadrocellata* Storer, Boston Pr. ii., 242, 1847. Mem. A. A. S. viii. 397, pl. 31, f. 3.

Mitchill well describes the coloration. "The uniformity of color is interrupted by four dark spots on the back, two on each side of the lateral line. One of the two on each side is about midway of the length, and the other near the tail. The former are about three-quarters of an inch in diameter [in a specimen 15 × 6]; the latter not so considerable." This description, therefore, cannot be referrible to a variety of the common species.

The radial formula of Mitchill, (D. 79. A. 59), is not applicable to this *Chænopsetta*, nor *C. ocellaris*, and is probably either the result of a typographical error, or carelessness in enumeration. The *Chænopsetta dentata* exhibits no trace of spots.

##### REINHARDTIUS Gill, 1860.

*Platysomatichthys* Blkr., 1862.

##### REINHARDTIUS HIPPOGLOSSOIDES Gill.

*Pleuronectes cynoglossus* Fab., F. G. 163, sp. 118, 1780.

" *hippoglossoides* Walb., Art. Gen. 115, 1782.

" *pinguis* Fab., 1821.

[Oct.

*Hippoglossus pinguis* Reinh.

Reinhardtius hippoglossoides Gill, Cat. 50, 1860.

Platsomatichthys pinguis Blkr., 1862.

*Hippoglossus grœnlandicus* Gthr., Cat. iv. 404.

This species had by common consent been identified with the *Pleuronectes cynoglossus* of the Fauna Grœnlandica—afterwards named by Walbaum *P. hippoglossoides* and by Fabricius *P. pinguis*—until the year 1862. In that year, Dr. Günther\* contended that the "*Pleuronectes cynoglossus*, Fabr. Faun. Grœnl. p. 163, or *Pl. pinguis*, Fabr. Vidensk. Selsks. Naturv. Math. Afhandl. i. p. 43, tab. 2, f. 1, is probably identical with *Pl. cynoglossus* Gronov. and Linn., as the only difference of any importance appears to be that the Greenland fish is said to have 72—74 rays in the anal fin. It is evident, however, from a single glance at the figure, that it is generically different from *Hippoglossus*."

The following characters are the most distinctive respectively assigned to the *Pleuronectes cynoglossus* by Fabricius, and the species of the same name by Günther. It is necessary, however, to first premise that the true *Hippoglossus vulgaris*, as acknowledged by Reinhardt, &c., is first described, after which follows the description of "*P. cynoglossus*," Fabr., which is said to be allied to the *P. Hippoglossus*, but to be smaller and more oblong.

PLEURONECTES CYNOGLOSSUS Fabr.

"D. 96. P. 14. V. 6. A. 72.

"Vix 26 unc. longitudinem et 8 unc. latitudinem superans."

Height : Length = 1 : 3 $\frac{1}{4}$ .

"Utraque maxilla dentata, dentibus curvis, acutis† rarioribus tamen ac in hippoglossos, &c.

"† Hoc nota differre præsertim videtur a cynoglossos Gronovii in systemate Linneano citato, cui tribuuntur dentes obtusi et cauda subrotunda, quod non ita se habet in pisce grœnlandico : hæsito igitur, an idem, quod musei gronoviani possessor determinare valet."

"Cauda subintegra. †

"Linea lateralis corpori concolora a cervice ad caudam oblique progreditur."

"Cetera ut in præcedente (*Hippoglossus*).

As negative evidence, the absence, so far as known, of the true *Pleuronectes* or *Glyptocephalus cynoglossus* in the Greenland seas, whose Ichthyology is so well known, is one of the strongest, especially as Fabricius states that his species is comparatively abundant and readily caught.

Equally explicit also is the description of the same species by Fabricius under the new name of *Pleuronectes pinguis*, in the Transactions of the Royal Danish Academy.‡

That description is indeed the amplification of the one in the "Fauna Grœnlandica." The fins are described, the caudal as emarginated, § the rays

PL. CYNOGLOSSUS L., Gthr.

"D. 102—117. A. 90—102." P.

(10) 11—12. V. 7.

Height : Length = 1 : 3—2 $\frac{3}{4}$ .

"Upper Jaw with a series of about twenty closely-set, truncated, incisor-like teeth on the blind side."

Caudal unusually convex or rounded behind.

"Lateral line straight, without curve" or noticeable obliquity.

\* Gthr. Cat. iv. 450, under *Pleuronectes cynoglossus*.

† In *P. hippoglossus*, "cauda fere integra," in *P. platessoides* (*Hippoglossoides platessoides*) "mag-na, lata, parum rotundata."

‡ Det Kongelige Danske Videnskaberne Selskabs. Nat. og Math. Afb. i. (1824,) p. 43, tab. 2. f. 1. § Spørfinner er bred, smalest ved Roden og bredest i yderste Rand, hvor den ligesom rundes ind ad.

D. 96—98, A. 72—74, P. 14—15, and the proportions and dentition are made known in essentially the same terms. Furthermore, the scales are said to be very small, and imbedded in the skin, which appears smooth and slimy to the touch;\* one of the eyes is nearly on the crown of the head,† and the branchial arches have large and robust rakers, each with eight pectinations, themselves divided at the tip.‡

As to the figure, it cannot assist identification, being a worthless caricature, and, like that of the *Hippoglossoides platessoides*, representing a small mouth. It might equally well serve as the representation of any Pleuronectoid, and is as unlike the *Glyptocephalus cynoglossus* as any other species.

From these remarks, it will be evident that I feel compelled to agree with the several excellent naturalists who have identified the Fabrician fish with a Pleuronectoid closely related to *Hippoglossus*, since every character which distinguishes it from *Glyptocephalus cynoglossus* is shared with the species under consideration.

#### HIPPOGLOSSUS Cuv.

##### HIPPOGLOSSUS AMERICANUS Gill.

*Pleuronectes hippoglossus* Mit.

*Hippoglossus vulgaris* Storer.

This species is distinguished from its European congener, with which it has hitherto been confounded, by all but Günther, by its higher body, more oblique mouth, &c. It is not clear why Dr. Günther should consider it, even with doubt, as identical with *Reinhardtius hippoglossoides*. The figure given by Dekay represents the form and fins of a *Hippoglossus*, and the lateral line is expressly said to be "arched over the pectorals." The species is, therefore, a typical *Hippoglossus*.

##### Subfamily RHOMBINÆ, Bon.

##### LOPHOPSETTA Gill.

##### LOPHOPSETTA MACULATA Gill.

*Pleuronectes maculatus* Mit. Rep. 1814, p. 9.

" aquosus Mit. Phil. Tr. i. 389.

*Rhombus aquosus* Cuv. R. A.

*Hab.*—Eastern coast generally.

##### CITHARICHTHYS Bkr.

##### CITHARICHTHYS MICROSTOMUS Gill.

D. 51. A. 58. C. 4. 6. 5. 3.

Scales  $42\frac{1}{14}$ .

*Hab.*—New Jersey to North Carolina.

#### Descriptions of new Genera and species of Eastern American PLEURONECTOIDS.

In a collection of rare fishes recently received through the kindness of Mr. F. W. Putnam and from the Salem Institute, was a fine new generic type of Pleuronectoids, distinguished by some remarkable characters. To make this known, and also especially a new species of *Citharichthys*, obtained by Prof.

\* Overfladen har vel paa begge Sider mange smaa Skjal; men de sidde saa fast i Huden, at de neppe lade sig Skjalue derfra, saa den er glat at føle paa fuld af Slim.

† Øjnene sidde begge paa højre Side, det ene af dem næsten paa Hovedets Isse.

‡ Gjælerne ere 4 med store og stærke hvide Klinger og mørkerøde Fryndser; bag til har hver Klinge 8 Kamtakker, hvilke atter for Enden have hver 2 smaa skarpe Tænder.



Baird and Dr. Stimpson at Beesley's Point, and by the latter and the author at Beaufort, North Carolina, the present article is submitted.

EUCHALARODUS,\* Gill.

*Body* oblong, ovate-rhombic, with the caudal peduncle moderate and uniform.

*Scales* minute, distant, immersed, each one on the colored side with several slender teeth behind directed outwards; on the light side smooth or uniciliate.

*Lateral line* straight, simple, continuous through a series of short tubes, channelled along their posterior half.

*Head* moderate, rhombic, depressed above the eye, with the snout nearly rectilinear and the rostral area rhombic; covered with minute scattered scales extending along the interorbital area, and with an osseous ridge below the upper eye, and continued from its hinder angle backwards, where it is expanded, and separated from an oblique bony tubercle on the scapula. *Eyes* moderate, approximated, even, chiefly in the anterior third of the head. *Nostrils* of the dark side even longitudinally, the anterior next to the border of the snout; the posterior between orbits in front; of the left side, on the left side of the ridge, approximated; the hinder close in front of the dorsal fin at its inner angle; anterior nostrils tabular and nearly blind, minutely perforated near the end; posterior transversely fissured, with lips. *Opercula* well developed.

*Mouth* moderately small, with the cleft oblique (c. 45°) in front of eye; the jaws of the respective sides nearly equal; the lower scarcely prominent, and with a very obtuse, rounded chin.

*Lips* moderate and simple; the latter attached by a frœnum at the left side of the symphysis.

*Tongue* slender, but well developed and free.

*Teeth* uniserial, in an imperfect row on the dark side, moderate, moveable, reclining inwards, compressed, capitate or constricted near the apex, and with the apex itself blunt and emarginate, especially towards the symphysis; palate smooth.

*Branchial apertures* free below, closed above the operculum.

*Branchiostegal rays* seven, exceptionally six.

*Dorsal fin* with its rays simple, in moderate number; its origin above the upper eye, rapidly increasing, and with its rays converging towards the posterior third.

*Anal fin* with its middle rays highest, but directed obliquely forwards, and with no true spine in front.

*Caudal* convex behind.

*Pectoral fins* moderate, obliquely rounded behind.

*Ventral subbrachial*, normally developed.

The interior pharyngeal bones are united, oblong, triangular, with the sides rectilinear; the posterior margin broadly emarginate, (without sinus at the junction) bent upwards and trenchant; behind and beneath sloping forwards, and with a wide trihedral enlargement expanded downwards below at the middle. The teeth are blunt, paved, and on all the upper surface, except the deflected posterior marginal area. The lower pharyngeals are oblique, the middle largest; the first and second with two rows of molar teeth; the third with one.

The branchial arches are provided on their external surfaces with soft, compressed, unarmed, subunguiform rakers, decreasing from the first to the fourth, oblong on the first, very short on the fourth, which alone has rudimentary rakers on the internal surface.

Such is the combination of characters, which distinguishes this remarkable

\* Εὖ, well; χαλαρὰς, loose; ὀδούς, tooth.

newly-discovered type among the genera of Pleuronectoids. From the American genera *Pseudopleuronectes*, Blkr., *Liopsetta*, Gill, *Myzopsetta*, Gill, and *Limanda*, Gottsche, it is at least distinguished by its squamation, oculo-scapular ridge, nostrils, dentition and structure of the dorsal and anal fins. It is most nearly related to *Pleuronectes*,\* with which it agrees in the free tongue, but the more perfect union and the triangular form of the wholly united lower pharyngeal bones, the want of an anal spine, and above all the moveable teeth and scarcely perforate anterior nasal tubes will especially distinguish it, not only from that genus, but from any other known one. So anomalous indeed are the characters of dentition and nostrils, that only after I had felt each tooth could I be convinced that they were really normally moveable, and that the condition was not the effect of disease, an idea which, improbable as it was, occurred to me. The remaining genera of the subfamily of Pleuronectinæ—*Platichthys*, Grd., *Parophrys*, Grd., *Lepidopsetta*, Gill, *Glyptocephalus*, Gottsche, *Microstomus*, Gottsche,† *Pleuronichthys*, Grd., *Hypsopsetta*, Gill, *Heteroprosopon*, Blkr., and *Clidoderma*, Blkr.—are equally or still more distinct than those already mentioned.‡

EUCHALARODUS PUTNAMI, Gill.

The height of the body enters between  $2\frac{4}{5}$  and  $2\frac{2}{3}$  times in the extreme length. The head enters about  $4\frac{1}{4}$ — $4\frac{1}{2}$  times in the same, and is not much longer than the caudal fin. There are about 19—20 teeth in the upper jaw, on the white side, and 9 or 10 on the dark; in the lower 11 to 13 on the white, and about 5 on the dark side. The height of the dorsal fin, at its highest portion, which is at or near the thirty-second ray, is little less than a seventh of the total length; the longest anal rays, from the thirteenth to fifteenth, equal or excel those of the dorsal. The pectoral fin enters about  $6\frac{1}{4}$ — $6\frac{3}{4}$  times in the length, and attains to the vertical from the twenty-third to twenty-seventh dorsal ray and eighth or ninth anal one. The ventral fin is inserted with its axil at the vertical of the upper axil of the pectoral, and reaches to the second or third ray of the anal; its length enters  $9\frac{1}{3}$ — $9\frac{3}{4}$  times in the total.

D. 55—58. A. 39—40. C. 3. 6. 6. 3. P. (3—4. 5. 2.) 10—11 V. 6.

The color is dark brown: sometimes (in the younger) the vertical fins are clouded with darker.

Two specimens, presented by F. W. Putnam, Esq., the Secretary of the Essex Institute, of Salem, Mass., have furnished the material for this description. Both

\* *Pleuronectes*, (Art.) Blkr. Verslagen en Mededeelingen der koninklijke Akademie van Wetenschappen (Amsterdam) xiii, 1862, 426—427.

† *Microstomus*, Gottsche, 1835 = *Cynoglossus*, Bon, Fauna Italica Fasc. xix, 1837, (sub *Plat. passer*) = *Cynoglossa*, Bon, 1846, &c. *Microstomus* is perhaps sufficiently distinct from *Microstoma*; if not, can *Cynoglossus* be used? Bonaparte, in his enumeration of the subgenera of *Pleuronectes*, after the definition of *Platessa*, gave that of *Cynoglossus*. "Secondo è *Cynoglossus* nob. che come il *Pl. cynoglossus* L. ha la linea laterale retta, la bocca piccola, li denti come quello di sopra [*Platessa*] ma la mascella uguale, con labbra turgide, e l'ano senza spina." Bonaparte has simply followed Nilsson in the erroneous identification of *Pleuronectes microcephalus* with *Pl. cynoglossus*, L. As the definition of his genus does not, however, apply to the latter and does to the former, it may perhaps be connected with it, notwithstanding the specific mention of the type.

I am aware that an anal spine has been recently denied to *Glyptocephalus cynoglossus*, but it is quite distinct in the specimen seen by me, and its presence has been admitted by other naturalists. On the other hand, a prominent spine has been attributed in one place to *Microstomus*, and denied in another; the latter view is sustained by naturalists generally. I am also aware that the lateral line has been said to be strongly curved, but a very slight curvature only seems to be evident in nature.

‡ Dr. Günther has referred to the group of narrow-mouthed Pleuronectoids with "the upper eye not in advance of the lower," four very well marked generic types—*Psammodesmus*, *Ammotretis*, *Rhombosolea*, and *Peltorampus*—which evidently have no affinity with *Euchalarodus*. Their systematic position even is for me doubtful, and some of them at least—especially *Peltorampus*—appear to belong to the family of Soleoidæ. As however the form, the distinction or not externally of the opercular bones, the structure of the mouth, the development of the branchial apertures, &c., have not been made known with sufficient precision, no definite opinion can be formed.

were caught, with others, by C. A. Putnam, Esq., in the harbor of Salem, in the month of January, 1858. To the able ichthyologist to whom we are indebted for our knowledge of the species, we dedicate it in token of friendly and scientific appreciation.

The next species appears to belong to a genus already established by Dr. P. Von Bleeker, but differs very decidedly from the known species.

CITHARICHTHYS *Blkr.*, *Gthr.*

CITHARICHTHYS MICROSTOMUS, Gill.

The height of the body enters about  $2\frac{3}{5}$  times (.36—37) in the extreme length; that of the caudal peduncle about eleven times. The head forms a fifth of the length, is rather abbreviated, scarcely sinuous above the eyes, blunt at the snout, which scarcely exceeds a seventh of the head's length, and the rostral area is rhombic, and not higher than long. The eyes are even; the longitudinal diameter contained about  $3\frac{3}{5}$  times (.05 $\frac{3}{5}$  in the head's length. The mouth is rather small, the length of the upper jaw only equalling a quarter of the length, and that of the lower two-fifths of the head's length. The teeth are very small, and close together; larger in front. The dorsal commences above the front of the orbit, and is highest, and convergent near the fortieth ray, which equals about the tenth of the total length; the anal is highest at about the twenty-fifth ray, and is high or even higher than the dorsal. The caudal is rounded behind, and forms about a sixth of the length. The pectoral fins are unequally developed, that of the dark side being prolonged, and contained only  $6\frac{2}{3}$  times in the total length, while that of the white side only equals a tenth of the same; the rays are all simple. The ventral fins are also unequally developed, the right being on the abdominal ridge at its origin, rather in advance of the opercular margin, and with its longest rays contained about fourteen times in the total length; stretched backwards, it extends to the second anal ray; the fin on the white side is more advanced, wider, and its rays longer, contained less than twelve times in the length, and extends backward to nearly the third anal ray.

D. 81. A. 58. C. 4. 6. 5. 3. P. 10. V. 6.

The scales are large, angular behind, covered with smaller ones, especially near the point of junction of contiguous ones, where alone they are developed on the blind side; the scales of the eyed side are mostly minutely ciliated behind, unarmed however near the lateral line, the scales of which last are quadrate and mostly covered; the scales of the blind side are less angular behind and unarmed. The lateral line runs through about forty-two scales, while of longitudinal rows there are ten above and fourteen below the lateral line.

The color is uniform reddish brown.

A single specimen, little more than three inches long, was first obtained by Prof. Baird at Beesley's Point. It is especially distinguished from its California relative, *O. sordida*, by the short snout, small mouth and large scales; *O. sordida* having about fifty-eight scales pierced by the lateral line, and eighteen rows above the lateral line. Notwithstanding this great disparity in the size of the scales and mouth, *C. microstomus* appears to agree in most respects with the Californian fish, as well as generically with *Citharichthys spilopterus* of Günther, species inhabiting the Gulf of Mexico. As the name *Citharichthys* was introduced a short time before that of *Orthopsetta*, proposed for the *Psettichthys sordidus*, and was framed for a species related to that type, that name must be adopted if the *O. sordida* is not regarded as generically distinct.

I may here remark that, although I have referred the *Platessa quadocularis* of Storer to the genus *Chænopsetta*, (*C. oblonga*), it is possible that it may not truly belong to that genus, as the dorsal and anal fins are represented as in-  
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creasing backwards till near their ends, and the anterior dorsal rays are free at their ends; but as the species agrees so closely in other external characters, I feel compelled to retain it in that genus for the present at least.

In this connection, I may also mention a species found at Pensacola, which exhibits several characters in common with the species referred to, but represents a distinct genus closely related to *Chænopsetta*, *Paralichthys* and *Pseudorhombus*; the naso-dorsal side of the rhombic outline is very convex; the supra-ocular region depressed; the interorbital area formed by a narrow, scaleless ridge; the caudal peduncle short; the scales ctenoid, and the dorsal and anal fins respectively highest, and convergent far behind and at nearly the same vertical. The species has a height of little less than half the extreme length; the head almost a fourth, and the caudal almost a fifth. The first fin rays are the longest and filiform, progressively increasing, and the fin itself commences at a vertical between the orbit and pupil. The rays of the dorsal (70) converge towards the fiftieth; those of the anal (56) towards the thirtieth.

The color is reddish brown, with four ocellated spots larger than the eye; the first above the longer declining portion of the *fulciform* arch of the lateral line; the *three posterior forming the angles of a triangle*; the anterior two midway between the snout and caudal margin, and the posterior on the lateral line. It may be named *Ancylosetta quadrocellatus*.

#### On the Characters of the higher Groups of REPTILIA SQUAMATA—and especially of the DIPLOGLOSSA.

BY E. D. COPE.

Since it is only by an attentive consideration of the peculiarities of organized beings that their relationships in time present and past can be determined, the more complete that examination the more certain will our conclusions be. In the course of preparation of systematic work, the great need of well established bases is often felt, and nowhere more urgently than among the Reptiles. The following abstract, presenting some new views in this department, have been taken from my MSS., as exhibiting some of the stronger points among the multitudinous variations of the reptilian skeleton.

Prof. Johannes Müller\* has given us the best characters for distinguishing the Ophidia and Lacertilia, viz.:—The former having the ali- and orbito-sphenoid regions osseous—the latter membranous; there being one suspensorium for the quadratum in the first, two in the second. It is true he says *Acontias* forms an exception, having but one suspensorium, but I have seen the second in a specimen prepared by Herr Will, of Munich, and Prof. Peters showed it to me in a Berlin specimen. *Anelytrops*, a genus nearly allied to *Typhlosaurus*, possesses both, well developed. *Aniella*, however, appears to constitute a real exception to the rule, having but one suspensorium, thus resembling the *Ophiosaurii* or *Amphisbænia*: it resembles the latter so in its elongate temporal, continuous with the parietal, the downward prolongation of the latter bone and its close union with the occipital sclerotome, as to connect them closely with the Lacertilia. The true hiatus in the series of Squamata is, in my opinion, to be found between the *Ophiosauri* and *Tortricina*. The characters of the skeleton remaining up to the present time, by which Lacertilia and Ophidia may be distinguished, are as follows:

Lacertilia.	Ophidia.
Continuity of the parietal and sphenoid walls interrupted.	Continuity of parietal and sphenoid walls complete.
Rami of the mandible united by suture.	Rami united by ligament.

From the centre of multiplicity of forms of typical Lacertilia, we can pursue

\* Tiedemann and Treviranus Zeitschr. f. Physiologie, iv. p. 233.